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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/943,088	08/31/2001	Hans Van Der Laan	P 282855 P-0206.010-US	7680

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EXAMINER

NGUYEN, HUNG

ART UNIT PAPER NUMBER

2851

DATE MAILED: 04/02/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/943,088

Applicant(s)

VAN DER LAAN ET AL

Examiner

Hung Henry V Nguyen

Art Unit

2851

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on Amendment filed 1/2/03.
- 2a) ☐ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 02 January 2003 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States;

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

2. Claims 1-26 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Sakai et al (U.S.Pat. 5,925,887).

With respect to claims 11-12, Sakai et al (fig.1) discloses an projection exposure apparatus comprising all structures set forth in the claims including: a light source for supplying a projection beam of radiation (1), a first object table (3) for holding a transmissive mask (2); a second object table (6) for holding a substrate (5) at a substrate plane; a projection optical system (4) for projecting an image formed on the mask onto the substrate; at least one spot formation device for forming at least one spot of radiation from at least a portion of the projection beam such as: a light blocking plate (21) having a central pinhole at the substrate plane or the transmissive mask (2) defining a spot or pinhole at the mask plane; and a sensor comprises a

Art Unit: 2851

photodiode and charge couple device CCD 22 (see col.8, line 10-11) for measuring a spatial variation in intensity of defocused radiation from the at least one spot or an image thereof.

As to 13-15, 17, it is noted that the structure of a mask defining , pinholes , a non-transmissive areas, dots or stripes or diffracting elements such as grating, subsidiary dots, diffuser is well known per se and is considered as inherent teachings of the above mask (2).

The method claims 1-10 and 26 are seen to be inherent teachings in existence of the above apparatus.

3. Claims 1-3, 10-11, 13-15 and 26 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Nishigori et al (U.S.Pat. 5,846,678).

With regard to claims 1-3, 10-11, 13-15 and 26, Nishigori et al (fig.1) discloses an exposure apparatus comprising all basic features of the instant claims including a light source (1); a transmissive reticle (9) defining a pinhole; a projection optical system (10); a substrate (11) and a sensor for measuring a spatial variation in exposure amount of defocused radiation from the at least one spot or an image thereof.

4. Claims 1-26 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Irie et al (U.S.Pat. 6,118,516).

With respect to claims 1-26, Irie et al discloses an exposure apparatus and method comprising all of the limitations of the instant claims including: a light source (1) for supplying a projection beam of radiation , a first object table (9) for holding a transmissive mask (46) defining , pinholes , a non-transmissive areas, dots or stripes or diffracting elements such as grating, subsidiary dots, diffuser; and a second object table (13) for holding a substrate (5) at a substrate plane; a projection optical system (3) for projecting an image formed on the mask onto

Art Unit: 2851

the substrate; at least one spot formation device for forming at least one spot of radiation from at least a portion of the projection beam such as: a light plate (36) having a central pinhole at the substrate plane or the transmissive mask (2) defining a spot or pinhole at the mask plane; and a sensor (48-49) for measuring a spatial variation in intensity of defocused radiation from the at least one spot or an image thereof.

Response to Amendment/Arguments

5. Applicant's amendment filed January 2, 2003 have been entered. Applicant's amendments are sufficient in overcoming the objection of the drawings, the objection of the abstract, the objection of claims 16, 18-26 and the rejection of claims 15, 17 under 35 U.S.C. 112, second paragraph.

Turning to the art rejection, applicant's arguments have been carefully reviewed but they are not found to be persuasive. In response to applicant's argument that in Sakai, the light blocking plate 21 is at the same level of wafer 5 surface and is used to "measure radiation which is not defocused because the projection lens projects, i.e. focuses, the light from the device pattern of the reticle 2 onto the wafer plane"; the Examiner respectfully disagrees with the Applicant since this is not quite true. In Examiners' view, Sakai teaches a light blocking plate having a central pinhole, the CCD 22/radiation sensor which is disposed below the light blocking plate (see fig.1, col.4, lines 35-38) and is at a predetermined distance from the light blocking plate 21, so that it receives the light passing through the pinhole of the light blocking plate 21. In other words, light blocking plate is NOT used to measure the variation in intensity of radiation, as the Applicant interpreted. In fact, the pinhole of the light blocking plate is disposed at different positions within the imaging plane and thus the CCD 22/radiation sensor measures the

Art Unit: 2851

spatial light intensity which corresponds to the light intensity distribution of diffraction light from the device pattern of the reticle 13 (see col.6, lines 42-45), such as "the spatial variation in intensity of defocused radiation from the at least one spot or an image thereof" as broadly claimed.

With respect to the rejection of claims 1-26 under the art of Irie et al, applicant argues that in Irie et al, the reference mark plate 36 being on the wafer stage 13, simply measures radiation which is not defocused because the projection system 3 project, i.e., focuses the light from the reticle 46 onto the wafer 5, the Examiner respectfully disagrees with the applicant. In Examiner's opinion, Irie et al teaches the sensor (49)/radiation sensor which is used to measure the intensity distribution on the pupil plane FP of the projection optical system 3 of diffracted light emerging from the contact hole pattern 2. It is the Examiner's position that due to the distortion of the projection optical system (see col.16, line 20), the projection optical system 3 projects at least a slight degree of defocus light from the reticle 46 onto the wafer 5. Consequently, in the broadest sense, the radiation sensor 49 measures "the spatial variation in intensity of defocused radiation from the at least one spot or an image thereof" as broadly claimed.

The Applicant is totally silent in regard to the rejection of claims 1-3, 10-11, 13-15 and 26 under 35 U.S.C. 102(b) to Nishigori et al (U.S.Pat. 5,846,678) (see section 11 of the previous office action). Further, the applicant does not separately argue the distinct patentability of dependent claims. Thus, the Examiner believes that Nishigori meets all of the limitations of claims 1-3, 10-11, 13-15 and 26 and dependent claims 2-10, 12-23, and 25 are not additionally patentable over and above the patentability of independent claims 1, 11, 24 and 26.

Art Unit: 2851

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

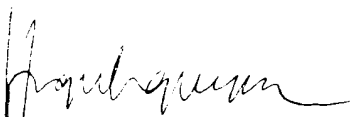
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung Henry V Nguyen whose telephone number is 703-305-6462. The examiner can normally be reached on Monday-Friday (First Friday off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Russ Adams can be reached on 703-308-2847.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4900.

Hvn
3/31/03


HENRY HUNG NGUYEN
PRIMARY EXAMINER